

In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

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1 1. (Currently Amended) A data transfer apparatus transferring  
2 data from a data source to a data destination comprising:

3 a first-in-first-out buffer memory having an input connected  
4 to the data source, an output connected to said data destination  
5 and a predetermined number of data entries;

6 a master queue counter storing a master count indicative of a  
7 number of data entries available for data storage within said  
8 first-in-first-out buffer memory, said master queue counter  
9 connected to the data source to decrement said master count upon  
10 allocation of data at said data source to be stored in said first-  
11 in-first-out buffer memory;

12 a remote queue counter storing a remote count indicative of a  
13 number of data entries within said first-in-first-out buffer memory  
14 currently storing data, said remote queue counter connected to said  
15 data source for incrementing said remote count upon allocation of  
16 data at said data source to be stored in said first-in-first-out  
17 buffer memory, said remote queue counter connected to said data  
18 destination for decrementing said remote count and generating a  
19 decrement confirmation signal upon transfer of data out of said  
20 first-in-first-out buffer memory to said data destination; and

21 wherein said master queue counter is further connected to said  
22 remote queue counter for incrementing said master count upon  
23 receipt of said decrement confirmation signal.

1 2. (Original) The data transfer apparatus of claim 1,  
2 wherein:

3        said master queue counter is initialized to said predetermined  
4        number of data entries of said first-in-first-out buffer memory;  
5        and

6        said remote queue counter is initialized at zero.

1        3.     (Original) The data transfer apparatus of claim 1,  
2        wherein:

3        said data source may allocate data to said first-in-first-out  
4        buffer memory only if said master queue counter indicates a non-  
5        zero number of data entries available for data storage within said  
6        first-in-first-out buffer memory; and

7        said data destination reads said first-in-first-out buffer  
8        memory only if said remote queue counter is non-zero.

1        4.     (Currently Amended) The data transfer apparatus of claim  
2        1, wherein:

3        said data source may selectively annul allocation of data of  
4        said data source to be stored in said first-in-first-out buffer  
5        memory, said data source generating an annul increment signal upon  
6        annulling data; and

7        said master queue counter is further connected to said data  
8        source to increment said master count upon receipt of said annul  
9        increment signal.

1        5.     (Original) A method of transferring data from a data  
2        source to a data destination comprising the steps of:

3        maintaining a master count indicative of a number of data  
4        entries available for data storage within a first-in-first-out  
5        buffer memory;

6        allocating data from the data source to the first-in-first-out  
7        buffer memory only when the master count is non-zero;

8 decrementing the master count upon allocation of data at the  
9 data source to be stored in the first-in-first-out buffer memory;  
10 maintaining a remote count indicative of a number of data  
11 entries within the first-in-first-out buffer memory currently  
12 storing data;  
13 incrementing the remote count upon allocation of data at said  
14 data source to be stored in said first-in-first-out buffer memory;  
15 transferring data from the first-in-first-out buffer memory to  
16 the data destination only if the remote count is non-zero;  
17 decrementing the remote count upon transfer of data out of the  
18 first-in-first-out buffer memory to the data destination;  
19 incrementing the master count upon confirmation of  
20 decrementing of the remote count.

1 6. (Currently Amended) The method of transferring data of  
2 claim 5, further comprising the steps of:

3 initializing the master count to the number of data entries of  
4 the first-in-first-out buffer memory; and  
5 initializing the remote ~~queue-counter~~ count to zero.

1 7. (Original) The method of transferring data of claim 5,  
2 wherein:

3 selectively annulling allocation of data of the data source to  
4 be stored in the first-in-first-out buffer memory; and  
5 incrementing the master count upon annulling allocation of  
6 data.

1 8. (New) A data transfer apparatus transferring data from a  
2 data source to a data destination in a plurality of pipeline stages  
3 comprising:

4 a first-in-first-out buffer memory having an input connected  
5 to the data source, an output connected to said data destination  
6 and a predetermined number of data entries;

7 a master queue counter storing a master count indicative of a  
8 number of data entries available for data storage within said  
9 first-in-first-out buffer memory, said master queue counter  
10 connected to the data source to decrement said master count upon  
11 allocation of data at said data source to be stored in said first-  
12 in-first-out buffer memory during a first pipeline stage;

13 a remote queue counter storing a remote count indicative of a  
14 number of data entries within said first-in-first-out buffer memory  
15 currently storing data, said remote queue counter connected to said  
16 data source for incrementing said remote count upon allocation of  
17 data at said data source to be stored in said first-in-first-out  
18 buffer memory during a second pipeline stage after said first  
19 pipeline stage, said remote queue counter connected to said data  
20 destination for decrementing said remote count and generating a  
21 decrement confirmation signal upon transfer of data out of said  
22 first-in-first-out buffer memory to said data destination during a  
23 third pipeline stage after said second pipeline stage; and

24 wherein said master queue counter is further connected to said  
25 remote queue counter for incrementing said master count upon  
26 receipt of said decrement confirmation signal during a fourth  
27 pipeline stage after said third pipeline stage.

1 9. (New) The data transfer apparatus of claim 8, wherein:  
2 said master queue counter is initialized to said predetermined  
3 number of data entries of said first-in-first-out buffer memory;  
4 and  
5 said remote queue counter is initialized at zero.

1        10. (New) The data transfer apparatus of claim 8, wherein:  
2        said data source may allocate data to said first-in-first-out  
3 buffer memory during said first pipeline stage only if said master  
4 queue counter indicates a non-zero number of data entries available  
5 for data storage within said first-in-first-out buffer memory; and  
6        said data destination reads said first-in-first-out buffer  
7 memory during said third pipeline stage only if said remote queue  
8 counter is non-zero.

1        11. (New) The data transfer apparatus of claim 8, wherein:  
2        said data source may selectively annul allocation of data of  
3 said data source to be stored in said first-in-first-out buffer  
4 memory during a fourth pipeline stage after said first pipeline  
5 stage and before said second pipeline stage, said data source  
6 generating an annul increment signal upon annulling data; and  
7        said master queue counter is further connected to said data  
8 source to increment said master count upon receipt of said annul  
9 increment signal during a fifth pipeline stage after said fourth  
10 pipeline stage.